

- 28 -

CLAIMS

1. A single-crystal growth apparatus which comprises spheroid mirrors, heat sources located at the one foci of the spheroid mirrors, a feed rod and a seed crystal rod located at the other foci of the spheroid mirrors, a quartz tube surrounding the feed rod and seed crystal rod, and shaft drive means for rotating and vertically moving crystal drive shafts respectively supporting the feed rod and seed crystal rod, and in which infrared rays of the heat sources are reflected by the spheroid mirrors to irradiate the feed rod and seed crystal rod located at the other foci, thereby growing single crystal,

which single-crystal growth apparatus is characterized in that the interfocal distance of the one and other foci is made 41.4 – 67.0 mm and the minor axis / major axis ratio of the spheroid mirrors is made 0.90 – 0.95.

2. The single-crystal growth apparatus set out in claim 1, characterized in that the major axes of the spheroid mirrors are set to 57.7 – 80 mm, the minor axes to 52 – 76 mm, and the total power of the heat sources to 1,100 – 1,500 W, thereby making it possible to achieve heating performance of 2,000°C.

3. The single-crystal growth apparatus set out in claim 2, characterized in that the spheroid mirrors are of the bi-spheroid type and the total power of the heat sources is set to 1,100 – 1,500 W, thereby making it possible to achieve heating performance of 2,000°C.

4. The single-crystal growth apparatus set out in claim 3, characterized in that

the spheroid mirrors include internal water-cooling jackets,

the ends of the spheroid mirrors in the major axis direction are formed with heat source insertion holes for inserting the heat sources into the inner space of the spheroid mirrors, and air-cooling units are provided for introducing cooling gas

- 29 -

for cooling the spheroid mirrors and heat sources from gap regions inward of the heat source insertion holes into the inner space of the spheroid mirrors at a flow rate of 1.2 – 2.3 m³ / min.

5. The single-crystal growth apparatus set out in claim 4, characterized in that it is configured so that the flow of the cooling gas introduced into the spheroid mirrors from the air-cooling units becomes turbulent in the inner space of the spheroid mirrors to cool the inner surfaces of the spheroid mirrors and the heat sources located in the inner space of the spheroid mirrors.

6. The single-crystal growth apparatus set out in claim 4, characterized in that it comprises a cooling water self-circulation-type heat exhaust system that has a path through which cooling water supplied to the water cooling jackets of the spheroid mirrors circulates via a radiator and dissipates the temperature of the cooling water by supplying cooling air to the radiator.